

Check, Checkmate and Stalemate and why it can be so confusing

Disclaimer: I don't know much about the history of chess and the intention behind its rules, so some of the things I am about to write might seem obscure to 2d-chess fans among us. I am approaching this from a game design perspective, in the sense that every gamerule should serve some predefined purpose.

Intention: I feel like the core of the confusion regarding checkmate and stalemate is that the rules of 2D-Chess are somewhat weird in the first place. 5D-Chess takes a very rational approach to extending the rules to 5D, and with all those additional degrees of freedom the weirdness of the original Chess rules becomes way more apparent, leading to long discussions in the discord.

The goal of this document is not to change the rules of Chess or 5D-Chess, but to give structure to the discussion, or at least to give structure to my own thoughts on the topic. Hopefully, people will jump into the discussion at whatever point they disagree with what I am writing here.

Assumptions:

1. Once upon a time the goal of Chess was to capture your opponent's king. That should be at the heart of any chess rules, 2D or 5D. I assume that the whole concept of check, checkmate and valid or invalid moves is only there, to prevent people from blundering an entire game by moving accidentally into check, or leaving their king in check. So these additional concepts are there, to protect the strategic element of chess and not because they have an inherent value in themselves.
2. You have to make a move. In 2D-Chess this means moving a piece, in 5D-Chess this means shifting the present to the other player.

Why I think 2D-Chess is weird

- A. I think the rule, that moving into an attack on your king is forbidden, is too strict. I will refer to this rule from now on as Rule 1. When you have moves that do move you into an attack and you have moves that do not move you into an attack Rule 1 makes sure that you make a move that does not move you into an attack. This prevents the game from ending too soon.
However, if all your moves move your king into an attack, this rule should in my opinion not apply. Due to Assumption 2 one has to make a move no matter what. If that forces you to move into an attack on your king, so be it. Having Rule 1 apply to this case would also be a mistake according to Assumption 1, as this would give the rule an inherent value beyond preventing the game from ending too soon.
- B. As a result of Rule 1 being too strict, the concept of stalemate is applied too broadly. Assumption 2 forces you to make a move, however in 2D-Chess and in 5D-Chess, there are situations in which this is not possible (There will be examples further down below). The purpose of Stalemate is to resolve these situations. If you cannot make a move the game ends in a draw. In 2D-Chess Rule 1 treats situations in which you can only move into an attack on your king as having no moves at all and declares the situation as stalemate. After restricting Rule 1 as suggested in A., this would no longer be a stalemate, as one can and must move into an attack on your king, since it is the only move you have (Assumption 2).

- C. Checkmate is if all your moves move your king into an attack and your king is in check. This introduces a dependency on the definition of check.

The FIDE rules define check as follows: *“The king is said to be ‘in check’ if it is attacked by one or more of the opponent’s pieces, even if such pieces are constrained from moving to that square because they would then leave or place their own king in check. No piece can be moved that will either expose the king of the same colour to check or leave that king in check”.*

This raises the question of what an “attack” is. The FIDE rules say: *“A piece is said to attack an opponent’s piece if the piece could make a capture on that square according to the Articles 3.2 to 3.8. [These Articles describe piece-movement.] A piece is considered to attack a square, even if such a piece is constrained from moving to that square because it would then leave or place the king of its own colour under attack.”*

I think that this definition is highly ambiguous as it is not clear what “could make a capture” really means. Does it mean that a piece can capture right now in this moment, assuming that it could move right now, does it mean that a piece can capture once it is the opponent's turn, or does it mean that a piece can capture if we would pass, so that it is the opponent's turn? In my opinion this is a problem and the main reasons why we have discussions on certain board-states. This ambiguity is almost never relevant in 2D-Chess, however there are certain set-up board-states in which it would be relevant. I feel like in 5D-Chess this ambiguity happens a lot and leads to quite a bit of confusion. There will be examples showcasing this ambiguity later on. I will refer to these interpretations as Interpretation 1 (pieces can capture right now), 2 (a piece can capture once it is the opponent's turn) and 3 (a piece can capture once we pass on all boards) respectively.

My suggestion to fix this ambiguity would abolish the concept of check all together and redefine checkmate. Interpretation 1 conflicts with Assumption 1, i.e., the goal of the game is to capture the opponent's king which you can only do on your turn.

Interpretation 2 implies together with a strict Rule 1 that all checkmates are actually stalemates. Interpretation 3 conflicts with Assumption 2, i.e., you cannot pass, you have to make a move. There might be other interpretations that I missed and what should be considered as passing is ambiguous for 5D-Chess. For 5D-Chess I will assume that passing means passing on all active boards. I will only discuss Interpretations 1 and 3 in the future as Interpretation 2 is ridiculous if we keep a strict Rule 1.

Redefining rules and concepts such that they are consistent with the assumptions made

Rule 1:

As discussed previously, this rule only prohibits making a move that leads to your king being captured while you have moves that do not lead to your king being captured. The rule does no longer prohibit moves that lead to your king being captured while you have no moves that do not lead to your king being captured.

Stalemate:

If you cannot make a move as described in Assumption 2 you are in stalemate. The game ends in a draw. This makes these modified stalemates a subset of the standard stalemates.

Checkmate:

If you have moves and they all result in your king being captured, you are in checkmate and lose the game. (Here I assume that the opponent would always capture your king if they could.)

This makes these modified checkmates a superset of the standard checkmates.

Check:

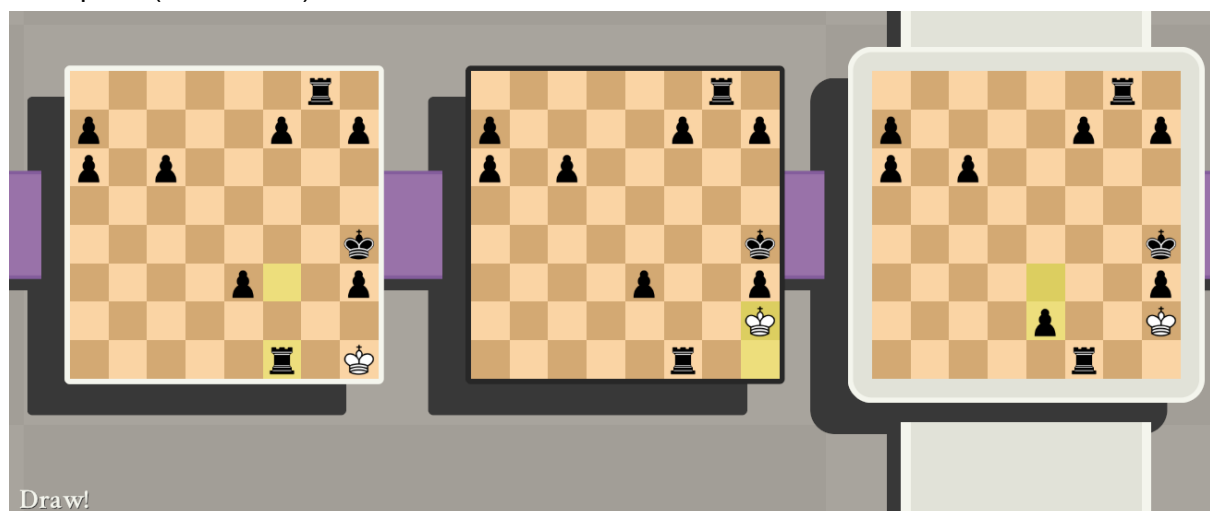
The concept of check is obsolete. It does not affect the gameplay in any way. It's only purpose is to raise awareness that your move-options are now severely restricted.

The fact that there are many different degrees of restriction you can have, is what makes it so hard to define check for 5D-Chess. What kind of restrictions on your move-options should be considered a check (and marked with a red exclamation mark) is a different discussion all together and one that I would like to stay away from for now.

Examples

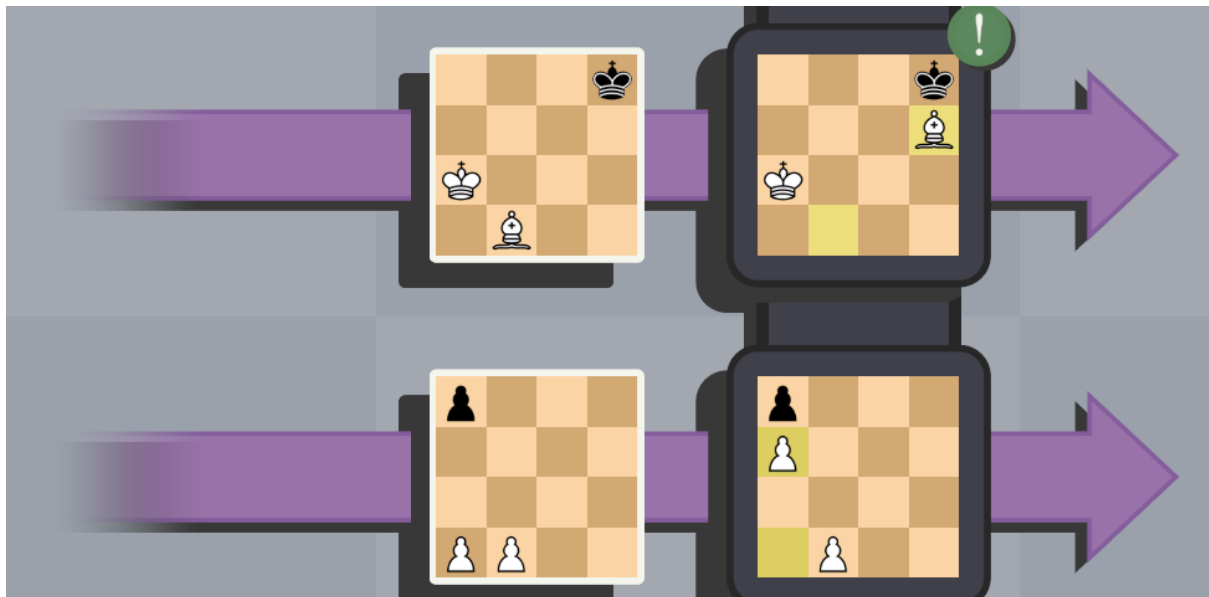
I will refer to standard Chess rules as "SR" and to the suggested modified rules as "MR". I will refer to 5D Chess With Multiverse Time Travel as "the game".

Example 1 (2D and 5D):



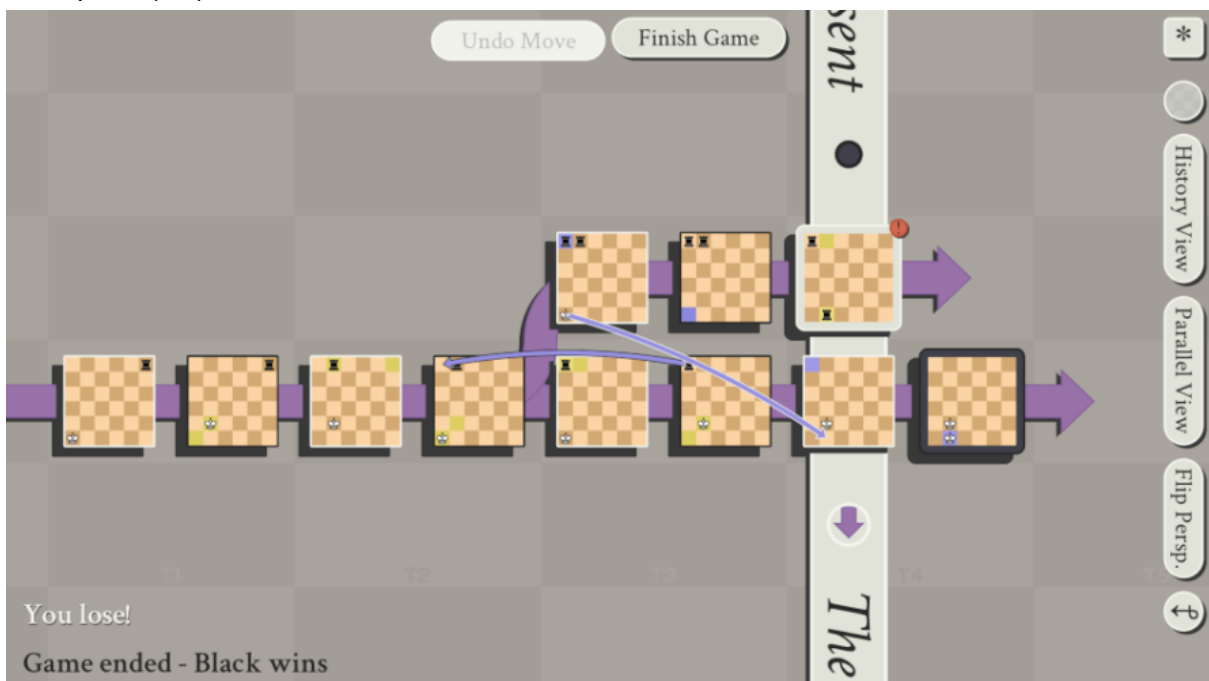
Here we see Rule 1 being too strict. There are moves for white and all of them allow the king to be captured. According to SR this is a stalemate. According to MR this should be a checkmate. The game applied therefore SR and follows a strict Rule 1.

Example 2 (5D):



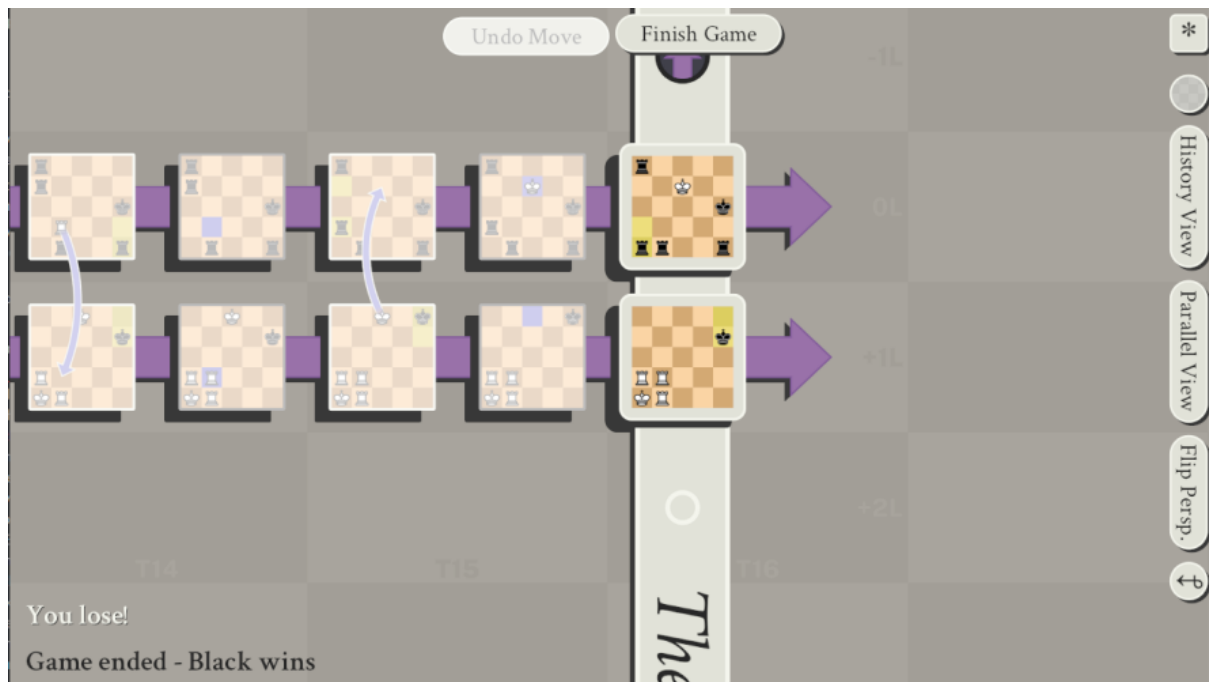
There are moves for black (jump with the king to the other timeline) and all of them allow the king to be captured. According to SR this is ambiguous. Interpretation 1 leads to a stalemate as there is no past board yet that could be attacked. Interpretation 3 leads to a checkmate as passing leads to the bishop capturing the past king. According to MR this is a checkmate. Therefore, the game does not acknowledge Interpretation 1.

Example 3 (5D):



There are no moves for white. According to SR Interpretation 1 there is no check and the game is a stalemate. According to SR Interpretation 3 there is a check across timelines. Since all moves leave white under attack (there are no moves and “for all”-statements on empty sets are always true) and there is a check this is a checkmate.

According to MR there are no moves for white and it is therefore a stalemate. Again we can see that the game was in accordance with Interpretation 3. Example 4 (5D):



There are many moves for white and all of them allow the king to be captured (as both timelines progress). According to SR this is checkmate as the rook on the upper timeline attacks the king on the lower timeline in both Interpretations. According to MR this is a checkmate, as white must make a move and they all result in the king being captured.

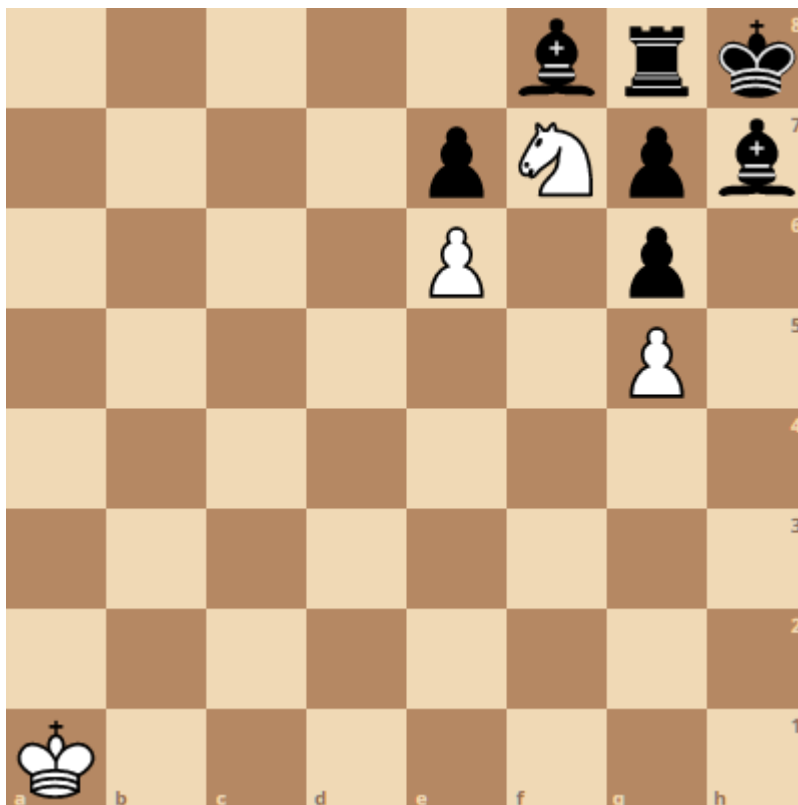
Notice how there are no arrows indicating a check. CTP commented on this:

"I thought a lot about expanding the "!" to be more than one board, but I decided against it for a few reasons.

The first is that 1-click-1-board-1-undo is simpler and more intuitive (important).

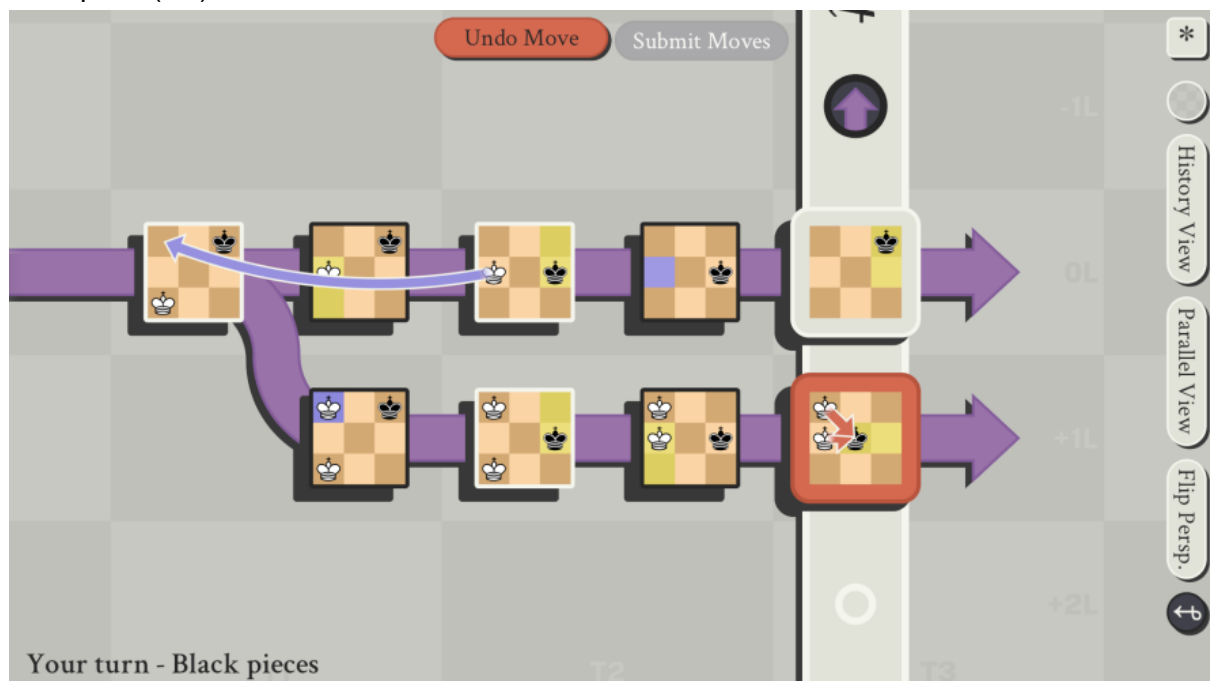
The obvious alternative would be to pass on multiple boards at once, which would possibly be all the boards in the present. The other problem with trying to always show a "!" when it's checkmate is that the attack may only show after forced moves on some boards, which would mean the "!" now has to choose moves rather than just pass, which is even more complicated again."

Example 5 (2D):



Here we see for a 2D game how Interpretations 1 and 3 conflict with Assumptions 1 and 2 respectively. Black has no moves. According to SR this is checkmate in both interpretations. According to MR this is a stalemate as black cannot make a move.

Example 6 (5D):



This one is a little bit off-topic but still very interesting.

The game does not let you submit this. Assumption 2 suggests that white has to make a move, meaning that a jump to the upper timeline needs to be made. Therefore the black king cannot be captured and black made a valid move according to MR. In this case we can consider white's situation. I will do so for all three variants even though only MR can lead us to this in the first place.

White has moves and all of them lead to the king being captured. According to SR the white king is in check in both interpretations so this is a checkmate.

According to MR white has to move and gets captured, so this is a checkmate.

Conclusion

I explained why I find the standard 2D-Chess rules weird and ambiguous. I have suggested various interpretations for those ambiguities and I suggested new rules that are in accordance to certain assumptions and avoid ambiguities to the best of my knowledge. I showcased these interpretations and new rules in various examples.

It seems that the game follows some system in accordance with interpretation 3. I do not think that the game needs to change anything in this regard. I am sure the confusion on different board-states will remain but they are rare enough that it is probably best to not change a game that we all so much enjoy.

Acknowledgements and References

Thanks to Aquababy, AverageHuman, ctp and pseudoAbstractMeta for providing example images. Also thanks to ctp for making this game.

You can find the FIDE rules I was citing under:

<https://www.fide.com/FIDE/handbook/LawsOfChess.pdf>